Challenges in Sewage Management for Small Cities

“Small Cities are different than large ones – not just smaller! “

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1. Current Status in India
2. Challenges faced by Small Cities
3. Possible Interventions
4. Creative Solutions
5. Jamshedpur Perspective
CURRENT STATUS IN INDIA

- The wastewater generation is 29000 MLD from different towns & cities
- The wastewater treatment is only 6000 MLD from different towns & cities
- Only 20% of generated sewage being treated before discharge it in the water bodies

*Source:* Status of Sewage Treatment in India CPCB Report Nov-2005
The mode of disposal is:

- Indirectly into the rivers/ lakes/ ponds/ creeks in 118 cities;
- On to the agriculture land in 63 cities;
- Directly into rivers in 41 cities.
- In 44 cities, it is discharged both into rivers and on agriculture land.

In many of the coastal cities, the wastewater finds its way into estuaries, creeks, bays etc. (Around 25% of total wastewater)
Challenges Faced By Small Cities - The ‘Low Equilibrium’ Cycle

- Low Level of Infrastructure
- Low Service Level
- Low Maintenance
- Low Capacity to Pay
- Low Investments
- Low Collection/Recovery
Challenges Faced By Small Cities- Process perspective

- Deficiencies in Sectoral Responsibilities: Collection and Conveyance
  - Inadequacy of sewer network
  - Non-Connection of Households to Existing Sewerage Network
  - Open Defecation
  - Inadequate Maintenance of Sewers
- Deficiencies in Sectoral Responsibilities: Interception and Diversion Works
  - Partial Coverage of the Interception and Diversion
  - Non-Tapping of Nallas in Areas where City Expanded
  - Frequent Chocking and Leaking of Conveyance System
  - Inadequate Treatment Facilities
  - Irregular Operation and Maintenance of Treatment Capacities
- Deficiencies in Performing Generic Functions
  - Deficiencies in Planning and Designing of Sewer Network
  - Building Sewers and Sewage Treatment Infrastructure
  - Operation and Maintenance of the Assets
  - Weak monitoring, evaluation and regulation

Source: The Economics of Municipal Sewage Water Recycling and Reuse in India by Pritika Hingorani
Possible Interventions

To come out of the - LOW EQUILIBRIUM CYCLE

- Water & waste water Regulator
- Strong political will
- “Holistic” town planning
- Sewerage tariff
- Good incentive Structure to ensure adequate recycle & reuse of Sewage
The following factors need to be taken into consideration when selecting a wastewater treatment process for a small City:

1. Effluent Water Quality Requirements for Discharging / reuse
2. Flow Rate
3. Cost
4. Available Space
5. Availability of Equipment and Parts
6. Availability of Operators and Repairmen
7. Discharging vs. Non-discharging – Norms
8. Flexibility for Process Changes or Expansion – to meet future requirement
9. Preference– technology
10. Local Topography/Geology
The following are criteria to be considered in selecting a collection system:

1. Building Density
2. Slope
3. Soil type
4. Depth to Bedrock
5. Depth to Water Table
6. Operation and Maintenance Requirements
7. Management Requirements
8. Availability of Equipment and Parts
9. Availability of Operators and Repairmen
10. Costs
Creative Solutions

Need to find solutions that are within the means of the City to operate

- Localized & Customized Treatment e.g.- Packaged Sewage Treatment Plant (PSTP)
- Incentive for Recycle & Reuse of Treated Sewage
Jamshedpur Perspective - River to River System

Rivers (Subarnarekha & Kharkai)

- New River Pump House
- Old River Pump House
- Water Treatment Plant
- Raw Water Trunk Main
- Dimna Reservoir
- Clarified Water Trunk Main
- Potable Water Trunk Main

- Water Towers (Zone – 1)
- Water Towers (Zone – 2)
- Water Towers (Zone – 3)

- Sewage Treatment Plant 1
- Sewage Treatment Plant 2
- Sewer Trunk Main
- Sewage Pumping Stations (10 nos)

- Potable Water Distribution Network
- Sewer Collection Network

Industrial use Going for Zero Discharge
JAMSHEDPUR PERSPECTIVE - PRESENT SYSTEM

Approx 10 MLD return to Tata Steel

ASH POND

45 MLD Bara STP

16 MLD Bara STP

Sewage Pumping Station

Sewage treatment plant

Map showing the location of sewage treatment plants, pumping stations, and return flows to Tata Steel.
Waste Water Recycling - Jamshedpur

Cummins India-2010-150KLD MBBR Technology-Recycle water used for gardening and cooling water

Tata Tube Division-2012-150KLD MBR Technology-Recycle water storing to Cooling tank & use for gardening
Jamshedpur Perspective - Future Aspect

- Master Planning done for whole Jamshedpur Town regarding Sewer Service to aim for:-
  - 100 % coverage of the sewage collection system.
  - 100% treatment of collected sewage.
  - 100% reuse
  - Reduce the quantity of requirement of fresh water for the Industries & town by supplying recycled waste water and harvested water
Thank You